history of the dredge

WILLIAM A. THOMPSON

the dredge . . . the river . . . the people

william a. thompson

William A. Thompson was born on December 16, 1854, at Greenwich, New York, where he attended public school. He graduated from the University of Vermont with a degree in civil engineering in 1878 and entered Federal service that same year with the Corps of Engineers. In 1896, he was appointed to the position of Assistant Engineer, responsible for the improvements on the Mississippi River between Winona, Minnesota, and the mouth of the Wisconsin River at Prairie du Chien, Wisconsin. He held this post until his death in 1925.

"Captain" Thompson worked at Rock Island, Illinois, until 1885, when he was placed in charge of a suboffice established at LaCrosse, Wisconsin. He moved to LaCrosse in 1896 with his wife and son, and worked and lived in LaCrosse for the remainder of his career. Mr. Thompson was well-known and highly respected by the people he served along the river.

the river

This fluid lifeline known as the Mississippi River serves our country from its source in northern Minnesota to the Gulf of Mexico, a total of 2,350 miles. It permits an economic flow of goods and products between the Upper Midwest and distant parts of the world, as well as carrying recreation craft ranging from canoes and power boats to elaborate excursion vessels.

But it was not always as we see it now. Before the government engineers began snagging, dredging, and dam construction, it was a meandering, often treacherous, channel, threatening navigators with swift and turbulent reaches in high water and a boulder-strewn bottom in low water. Many a vessel, from canoe to keelboat to steamer and towboat, was sunk with loss of life and cargo.

In 1878, the Congress of the United States, recognizing the importance of the river to the development of our nation, authorized engineers to maintain a 4½-foot draft channel on the Upper Mississippi; this was extended to 6 feet in 1907. Wing dams, of brush mats and rock, were built; snags and boulders were removed; and shallow stretches were deepened by dredging.

Then, in 1930, the 9-foot channel was legislated by Congress to increase commerce on the river. The Corps of Engineers began construction of the series of 29 locks and dams between St. Louis and Minneapolis, creating a stairway of water for river traffic.

Thirteen of these locks are located in the St. Paul District, which maintains 243.6 miles of the 9-foot channel on the Mississippi River, as well as 24.5 miles on the St. Croix River and 17.4 miles on the Minnesota River. Because the river is constantly shifting its load of sand and sediment, and tributaries along the way contribute more, it is necessary to remove the material from the bottom of the channel to prevent a closure to navigation. This process of underwater excavation is called dredging.

dredging equipment

The major piece of equipment used for dredging is the hydraulic dredge, which consists of a centrifugal pump that draws in a mixture of water and excavated material through a suction pipe and discharges it through a pipe to a placement site. A hydraulic pipeline dredge transports the excavated material to the placement site by means of floating, submerged, or shore pipeline, or a combination thereof.

The cutterhead dredge is the most widely used pipeline dredge on the Upper Mississippi River. The head is a rotating assembly of spiral cutting blades surrounding a suction nozzle. It is driven by a shaft powered by a separate

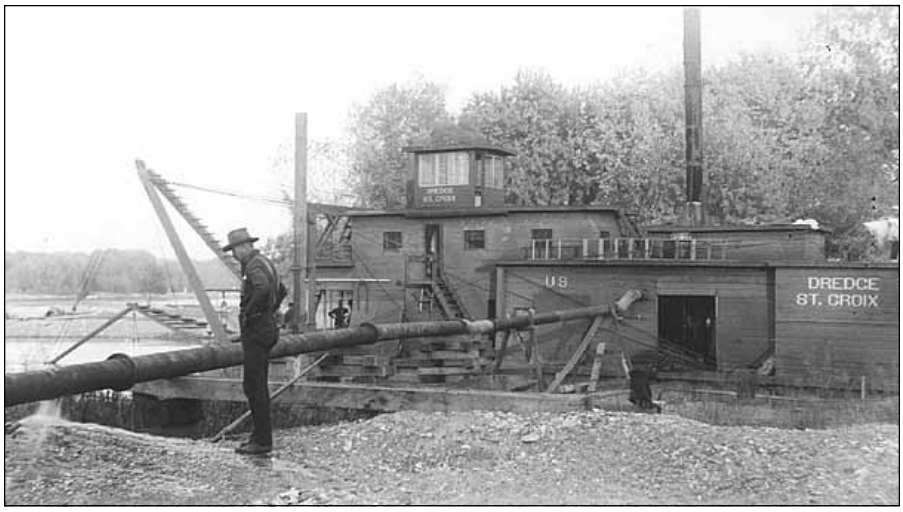
motor, and, when in operation, the cutterhead rotates against the material being dredged, cutting and mixing the material into a slurry, which is transported through the pipe.

The hydraulic pipeline dredge swings from side to side across the width of the dredge cut, pivoting on one of two cylindrical "spud" anchors located on the stern of the dredge hull. The swinging motion is achieved by winching on anchors set out from either side of the dredge and connected by cable to the dredge. The spud anchors are alternately raised and lowered as the dredge swings, to advance through the length of the dredge cut. In effect, the dredge "walks" its way along the river, as if on stilts.

The elevation of the cutterhead-suction pipe assembly can be adjusted for excavating material to the desired depth below water surface. The location and side-to-side swing in the river channel are controlled by electronic positioning equipment.

the early dredges

Three hydraulic dredges operated by the St. Paul District in the 1920s and 1930s — the *Vesuvius, Peelee,* and *Cahaba* — were responsible originally for the majority of the dredging done to maintain the channel. Other dredges used in the early days were the *Dundee, Taal,* and *St. Croix*. These early dredge boats did not have crew quarters on board, so barges with lodging and mess facilities, called quarterboats, accompanied each dredge. Crew members would be shuttled back and forth for meals and at shift changes. Many million cubic yards of sand and silt had to be dredged to establish the 9-foot channel, and the old steam dredges were slow, with the capability to move some 500,000 cubic yards of material during a season. A new dredge, with a far larger capacity and modern equipment, was needed to meet the challenges on the rivers.



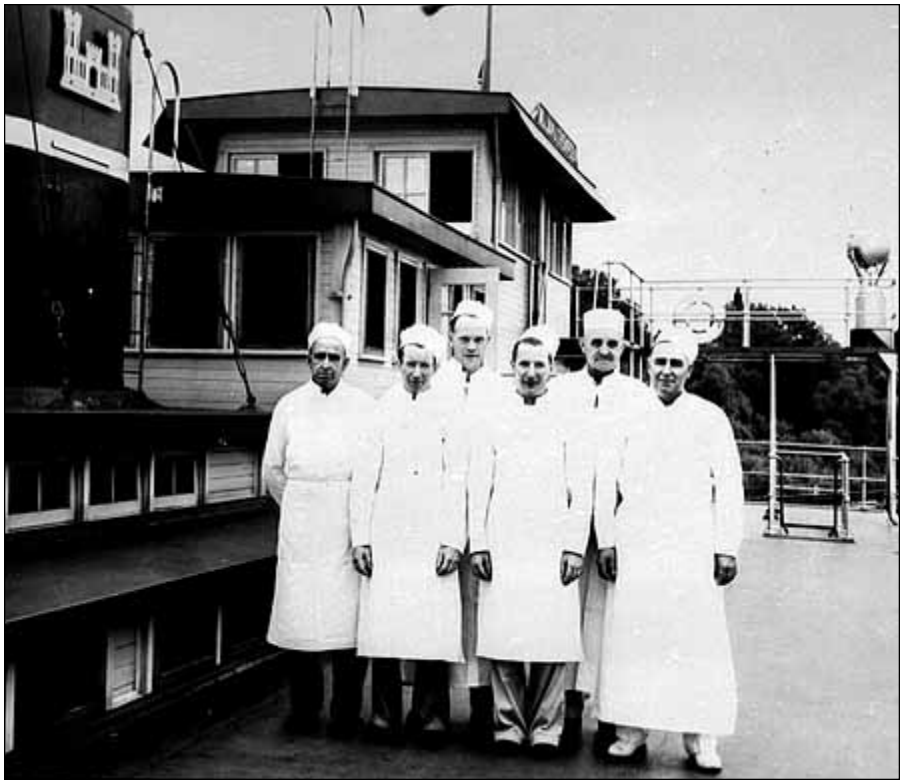
▶ The *St. Croix,* ca. 1910.

the dredge *william a. thompson*

Plans and specifications for a new, more efficient hydraulic dredge were begun in 1935. Built by Dravo Corporation, Pittsburgh, Pennsylvania, the *William A. Thompson* was christened there in 1937, a granddaughter of William Thompson breaking the traditional bottle on the hull. Construction cost was $846,130. The new vessel made the 1,700-mile trip down the Ohio River and up the Mississippi to the Corps Fountain City (Wisconsin) Service Base in 14 days, arriving on May 22, 1937.

The hydraulic dredge *Thompson* may be likened to a gigantic vacuum cleaner, as its pipeline-cutterhead sucks up the sand from the river bottom. It is capable of extracting some 1,800 cubic yards per hour, discharging the material through the pipeline to the placement site. The hydraulic pump is driven by an 1,800-horsepower diesel engine; two 850-horsepower diesel engines generate electrical power to run the two 500-horsepower motors used for propelling the vessel.

The *Thompson* is the biggest single piece of equipment used by the St. Paul District. It is 267 feet long from the tip of the cutterhead to its stern, 48 feet wide, and has a minimum bridge-clearing elevation of 52 feet, 9 inches. It has a 22-inch intake and 20-inch discharge.



▶ Galley crew of the Dredge *William A. Thompson* — May 31, 1939 — John E. Hoy, Second Cook; Alvin Tillman, Waiter; Addison Carlson, third cook; Harry H. Tillman, waiter; Louis Kochenderfer, waiter; and Oscar Muench, first cook.

The vessel can dredge to a depth of 26 feet and cut a channel 350 feet wide from one mooring. It generally operates with the booster barge *Mullen,* which increases the velocity through the pipe to carry the dredged material long distances. With the recent addition of two booster pumps and considerably more pipeline, the range of disposal has been extended to 9,000 feet. This makes it possible to place the dredged material in the most suitable locations to meet environmental concerns. The *Thompson* now is equipped with approximately 8,000 feet of pontoon-supported (floating) pipeline and 5,000 feet of shorepipe. It generally is accompanied on its mission by a 1,000-horsepower tender, workboats and barges, cranes, and tractors.

▶ Front view of the *William A. Thompson.*

By design, the *Thompson* is well-suited for working large, shallow-face dredge cuts. It is unique in its versatility and quick response time, features that are particularly appreciated when emergency dredging is required. The pipelines fit together like tinker toys for speedy setup and breakdown. And since the dredge is self-propelled, there is no need for a separate towboat.

In order to maintain a three-shift operation, the 1,370-ton dredge can carry up to 66 persons, for a four-crew complement, to work 24 hours a day, seven days a week.

The *Thompson* normally dredges 1.5 to 2 million cubic yards each year. It maintains 850 miles on the Mississippi River, in the St. Paul, St. Louis, and Rock Island Districts. It also works 24 miles on the St. Croix River and 335 miles on the Illinois River.

▶ Side view of the *William A. Thompson.*

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